

REMARKS

This application has been reviewed in light of the Office Action dated October 19, 2007. Claims 1-25 are pending in this application, of which Claims 1, 9, and 21 are independent. Claims 1, 2, 9, and 21 have been amended to define more clearly what Applicants regard as the invention. Favorable reconsideration is respectfully requested.

As requested by the Examiner, a certified copy of the foreign priority document will be submitted separately.

Claims 1-25 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,389,379 (*Lin*).

Claim 1 is directed to a method of emulating a design under test associated with a test environment. The method includes generating, in a first phase, a first file representative of a synthesizable portion of the test environment, and generating in a second phase, a second file representative of at least a part of the design under test. The first configuration file is delivered to a first reconfigurable hardware part forming a reconfigurable test bench so as to emulate the synthesizable portion of the test environment. The second configuration file is delivered to a second reconfigurable hardware part so as to emulate the design under test. The method also includes performing stimulation, using the reconfigurable test bench, to produce emulation test results. The first and second reconfigurable hardware parts are distinct and mutually connected.

Among other notable features of Claim 1 are that the first configuration file is delivered to a first reconfigurable hardware part forming a reconfigurable test bench so as to emulate the synthesizable portion of the test environment, and the second

configuration file is delivered to a second reconfigurable hardware part so as to emulate the design under test.

The general nature of Lin has been discussed adequately in previous papers, and it is not believed to be necessary to repeat that discussion.

In the previous Amendment, Applicants argued that Lin uses a single reconfigurable hardware model to implement both the design under test and the test bench. That is, in the portion of Lin (Fig. 67 and col. 11, lines 16-35) pointed to in the Office Action, an RCC computing system (2081) has a software model of the device under test and a software-implemented test bench, and an RCC Array (2084) has a hardware model of the device under test. However (Applicants argued in that Amendment) this cited portion of Lin does not teach or suggest the two distinct reconfigurable hardware parts recited in Claim 1 - one for the test bench and one for the emulator of the device under test; rather, the test bench in the arrangement shown in Lin's Fig. 67 is implemented in the software of the RCC computing system (2081).

In response, the Examiner states, at page 2 of the Office Action, that the RCC Computing System of Lin contains a CPU and a memory to process and model the user design using test bench processes. Further, the Examiner states that the RCC Computing Array of Lin contains the hardware model of the design under test.

However, as Applicants explain below, there are notable differences between the hardware presented in the RCC Computing System of Lin and the reconfigurable hardware parts of the method of Claim 1.

According to column 123, lines 41-44 of Lin, the RCC Computing System includes a CPU, a memory, an operating system and the necessary software to run the

single engine RCC system. Therefore, the RCC Computing System is merely a general purpose computer or workstation and the hardware of the RCC Computing System is a CPU with a memory. One example of the RCC Computing System would be a personal computer (PC) running on Windows having a simulator such as NC-Sim. Accordingly, the RCC Computing System of Lin, even if it may include hardware, is not made up of reconfigurable or variable circuits.

In contrast, in the method of Claim 1, the reconfigurable hardware parts are based on, as claimed, reconfigurable circuits -- for example FPGAs (Field-Programmable Gate Arrays) typically used in prototyping and emulation systems. These reconfigurable or variable circuits can mimic (or "emulate") the behavior of a hardware circuit. An example of a reconfigurable hardware part would be an FPGA manufactured by the company XILINX.¹

As explained below, Applicants have further clarified Claim 1 to even further emphasize the features of Claim 1 that distinguish over Lin.

In particular, the Examiner states, at page 2 of the Office Action, "it is unclear how through manipulation of the test bench processes the RCC Computing System does not anticipate a "reconfigurable hardware part."

In response, Applicants note that Lin discusses a method wherein a user's design (including a test bench) is partitioned to generate a software model and a hardware model. The software model includes the non-synthesizable portions of the design under test and the test bench and it is simulated by the RCC Computing System. The hardware

¹It is of course to be understood that the claims are not limited by the examples referred to.

model includes the synthesizable portions of the design under test and the test bench. The hardware model is synthesized and emulated by the RCC Array.

The method of Claim 1, in stark contrast, is directed to the implementation of the hardware model (i.e., the synthesizable part) on a reconfigurable hardware system (emulator or prototyping system) based on two distinct reconfigurable hardware parts. In this regard, Claim 1 has been clarified to recite that (1) the portion of the test environment implemented by the reconfigurable test bench is synthesizable and (2) the synthesizable portion of the test environment and the design under test are emulated on their respective reconfigurable hardware parts. Nothing in Lin would teach or suggest these features.

Nothing in Lin would teach or suggest a first configuration file is delivered to a first reconfigurable hardware part forming a reconfigurable test bench so as to emulate a synthesizable portion of the test environment, and that a second configuration file is delivered to a second reconfigurable hardware part so as to emulate the design under test, as recited in Claim 1.

Accordingly, Claim 1 is believed to be patentable over Lin.

Independent Claims 9 and 21 recite features similar to those discussed above with respect to Claim 1 and therefore are also believed to be patentable over Lin for the reasons discussed above.

The other claims in this application are each dependent from one or another of the independent claims discussed above and are therefore believed patentable for the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual reconsideration of the patentability of each on its own merits is respectfully requested.

CONCLUSION

In view of the foregoing amendments and remarks, Applicants respectfully request favorable reconsideration and early passage to issue of the present application.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,

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